REMARKS

Claims 17-19, 21, 23-26, 56 and 58-65 are all the claims presently pending in the application. Claims 17 and 61 have been amended to more particularly define the claimed invention. Claim 57 has been canceled.

It is noted that the claim amendments are made only for more particularly pointing out the invention, and not for distinguishing the invention over the prior art, narrowing the claims or for any statutory requirements of patentability. Further, Applicant specifically states that no amendment to any claim herein should be construed as a disclaimer of any interest in or right to an equivalent of any element or feature of the amended claim.

Claims 61-65 stand rejected under 35 U.S.C. § 102(b) as being allegedly taught by Ng (*Complete Guide to Semiconductor Devices* (1995)). Claims 17-19, 21, 23-26 and 56-60 stand rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Nakamura et al. (U.S. Patent No. 5,777,350) in view of Ng.

These rejections are respectfully traversed in view of the following discussion.

I. THE CLAIMED INVENTION

The claimed invention (e.g., as recited, for example, in claim 17) is directed to a method for producing a group III nitride compound semiconductor light-emitting device. The method includes producing an emission layer comprising a multi quantum well structure (MQW) with well layers and barrier layers, doping donor impurity into a first well layer and doping acceptor impurity into a second well layer adjacent to said first well layer in a producing process of said multi quantum well structure, and forming a barrier layer between the first and second well layers without doping, **the barrier layer having a bandgap which is greater than a bandgap of the first and second well layers** (Application at page 7, lines 7-16; page 9, lines 10-14; Figures 5A-5C; page 23, lines 1-25; Figure 16; page 37, line 5-page 38, line 3).

Conventional methods of forming an emission layer of a light-emitting device include doping an emission layer (e.g., a single emission layer) with an acceptor impurity and a donor impurity. However, the Coulomb forces between the acceptor and donor impurities cause a significant potential energy, resulting in a shift in the peak wavelength toward a shorter

wavelength in the luminous spectrum such that a desired wavelength (e.g., 500 nm) cannot be obtained (Application at page 3, lines 5-16; page 6, lines 1-13).

The claimed invention, on the other hand, forms a barrier layer between the first and second well layers without doping, the barrier layer having a bandgap which is greater than a bandgap of the first and second well layers. Thus, in the claimed invention, the acceptor impurity and the donor impurity may be separated by employing the barrier layer as an intervening layer. As a result, Coulomb's force between the acceptor impurity and the donor impurity can be decreased and luminous wavelength can be prevented from shifting to a shorter wavelength (Application at pages 6-7).

II. THE ALLEGED PRIOR ART REFERENCES

A. Ng

The Examiner alleges that Ng teaches the claimed invention of claims 61-65. Applicant submits, however, that Ng does not teach or teach or suggest each and every element of the claimed invention.

Ng discloses a device having quantum wells separated from one another by thick barrier layers (Ng at page 584).

However, Applicant submits that Ng does not teach or suggest "*forming a barrier layer between said first and second well layers without doping, **said barrier layer having a bandgap which is greater than a bandgap of said first and second well layers***", as recited, for example, in claim 17 and similarly recited in claim 61.

Specifically, the exemplary aspects of the claimed invention (e.g., as recited in claim 17) may include a light-emitting device with a multiple quantum-well structure. In multiple quantum-well structures, layers may be arranged as follows: a first well layer, a barrier layer, a second well layer, a barrier layer, a first well layer, a barrier layer, second well layer, barrier layer, first well layer, and so on.

Further, in the claimed invention, an acceptor impurity may be doped into the first well layer and a donor impurity may be doped into the second well layer (e.g., in a multiple quantum-well structure). Therefore, as described with respect to the multiple quantum-well structure above, in the claimed invention, the acceptor impurity and the donor impurity may

be separated by employing the barrier layer as an intervening layer. As a result, Coulomb's force between the acceptor impurity and the donor impurity can be decreased and luminous wavelength can be prevented from shifting to a shorter wavelength (Application at pages 6-7, Example 4 on page 23, Example 8 on page 37, and Figure 16).

Clearly, these novel features are not taught or suggested by Ng. Indeed, Ng merely teaches doping donor and acceptor impurities alternately into **semiconductor layers having the same band gap.**

The claimed invention, on the other hand, may include an MQW structure having a barrier layer which may be sandwiched between the first well layer and the second well layer (Application at page 7, lines 7-16; page 9, lines 10-14; Figures 5A-5C; page 23, lines 1-25; Figure 16; page 37, line 5-page 38, line 3).

Moreover, the barrier layer includes a band gap which is greater than the bandgaps of the first and second well layers. A donor impurity may be doped into the first well layer and an acceptor impurity may be doped into the second well layer. Thus, the claimed invention is completely different from the Ng device.

Therefore, Applicant respectfully submits that there are elements of the claimed invention that are not taught or suggested by Ng. Therefore, the Examiner is respectfully requested to withdraw this rejection.

B. Nakamura

The Examiner alleges that Nakamura would have been combined with Ng to form the claimed invention of claims 17-19, 21, 23-26 and 56-60. Applicant submits, however, that Nakamura would not have been combined with Ng, and even if combined, the combination would not teach or suggest each and every element of the claimed invention.

Nakamura discloses a nitride semiconductor device which includes an n-type clad layer 315, an active layer 316 and a p-type clad layer 317 (Nakamura at col. 27, lines 54-67; Figure 16).

Applicant respectfully submits that these references are unrelated and would not have been combined as alleged by the Examiner. Indeed, no person of ordinary skill in the art would have considered combining these disparate references, absent impermissible hindsight.

Further, Applicant submits that there is no motivation or suggestion in the references to urge the combination as alleged by the Examiner. Indeed, these references clearly do not teach or suggest their combination. Therefore, Applicant respectfully submits that one of ordinary skill in the art would not have been so motivated to combine the references as alleged by the Examiner. Therefore, the Examiner has failed to make a prima facie case of obviousness.

Moreover, Applicant submits that neither Nakamura, nor Ng, nor any alleged combination thereof, teaches or suggests "*forming a barrier layer between said first and second well layers without doping, said barrier layer having a bandgap which is greater than a bandgap of said first and second well layers*", as recited, for example, in claim 17 and similarly recited in claim 61. As noted above, this may help to prevent the luminous wavelength from shifting to a shorter wavelength (Application at pages 6-7, Example 4 on page 23, Example 8 on page 37, and Figure 16).

Clearly, these novel features are not taught or suggested by Nakamura. Indeed, the Examiner attempts to rely on Nakamura at cols. 9, 15, 43 and 44 to support his position. However, as noted above, these passages merely disclose a nitride semiconductor device which includes an n-type clad layer 315, an active layer 316 and a p-type clad layer 317. Further, the clad layers are unrelated to the active layers of an MQW structure.

Thus, nowhere in this passage, or anywhere else, does Nakamura teach or suggest forming a barrier layer between the first and second well layers without doping, the barrier layer having a bandgap which is greater than a bandgap of the first and second well layers. Therefore, Nakamura does not make up for the deficiencies of Ng.

Therefore, Applicant respectfully submits that these references would not have been combined and even if combined, there are elements of the claimed invention that are not taught or suggested by the alleged combination. Therefore, the Examiner is respectfully requested to withdraw this rejection.

III. FORMAL MATTERS AND CONCLUSION

In view of the foregoing, Applicant submits that claims 17-19, 21, 23-26, 56 and 58-65, all the claims presently pending in the application, are patentably distinct over the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest possible time.

Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary in a telephonic or personal interview.

The Commissioner is hereby authorized to charge any deficiency in fees or to credit any overpayment in fees to Attorney's Deposit Account No. 50-0481.

Respectfully Submitted,

Date: 10/27/05

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CERTIFICATE OF FACSIMILE TRANSMISSION

I hereby certify that the foregoing was filed by facsimile with the United States Patent and Trademark Office, Examiner Savitri Mulpuri, Group Art Unit # 2812 at fax number (571) 273-8300 this 27th day of October, 2005.

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